Abstract to the 3rd International Scientific Conference on the
Global Energy and Water Cycle (GEWEX), Beijing, 16-19 June 1999

Extratropical Influence of Sea Surface Temperature and Wind on Water Recycling Rate over Oceans and Coastal Lands

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Water vapor and precipitation are two important parameters confining the hydrological cycle in the atmosphere and over the ocean surface. In the extratropical areas, due to variations of midlatitude storm tracks and subtropical jetstreams, water vapor and precipitation have large variability. Recently, a concept of water recycling rate defined previously by Chahine et al. (GEWEX NEWS, August, 1997) has drawn increasing attention. The recycling rate of moisture is calculated as the ratio of precipitation to total precipitable water (its inverse is the water residence time). In this paper, using multi-sensor spacebased measurements we will study the role of sea surface temperature and ocean surface wind in determining the water recycling rate over oceans and coastal lands. Response of water recycling rate in midlatitudes to the El Nino event will also be discussed. Sea surface temperature data are derived from satellite observations from the Advanced Very High Resolution Radiometer (AVHRR) blended with in situ measurements, available for the period 1982-1998. Global sea surface wind observations are obtained from spaceborne scatterometers aboard on the European Remote-Sensing Satellite (ERS1 and 2), available for the period 1991-1998. Global total precipitable water provided by the NASA Water Vapor Project (NVAP) is available for the period 1988-1995. Global monthly mean precipitation provided by the Global Precipitation Climatology Project (GPCP) is available for the period 1987-1998.

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